

SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

Form S-3

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

PLURISTEM THERAPEUTICS INC.

(Exact name of registrant as specified in its charter)

Nevada

(State or other jurisdiction of incorporation or organization)

**MATAM Advanced Technology Park, Building No. 20,
Haifa 31905 Israel**

Tel: 011 972 74 710 7171

(Address, including zip code, and telephone number,
including area code, of registrant's principal executive offices)

98-0351734

(I.R.S. Employer Identification Number)

**Nevada Agency And Transfer Company
50 West Liberty Street Suite 880**

Reno, Nevada, 89501

(Name, address, including zip code, and telephone
number, including area code, of agent for service)

Copy to:

Edwin L. Miller Jr., Esq.

Zysman, Aharoni, Gayer and Sullivan & Worcester LLP

One Post Office Square

Boston, Massachusetts 02110

Telephone: (617) 338-2800

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Approximate date of commencement of proposed sale to the public: From time to time after this registration statement becomes effective.

If the only securities being registered on this form are being offered pursuant to dividend or interest reinvestment plans, check the following box. ☐

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box. ☒

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box. ☐

If this form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box. ☐

Large accelerated
filer ☐

Accelerated
filer ☐

Non-accelerated filer ☐
(Do not check if a smaller
reporting company)

Smaller reporting
company ☒

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered (1)	Amount To Be Registered	Proposed Maximum Offering Price Per Unit	Proposed maximum aggregate offering price (2)	Amount of registration fee (3)
Common Stock	(4)	(4)	(4)	
Warrants to purchase Common Stock	(4)	(4)	(4)	
Preferred Stock	(4)	(4)	(4)	
Units	(4)	(4)	(4)	
			\$150,000,000	\$17,415

- (1) There are being registered under this registration statement such indeterminate number of shares of common stock, number of warrants to purchase shares of common stock, number of shares of preferred stock and a combination of such securities, separately or as units, as may be sold by the registrant from time to time, which collectively shall have an aggregate initial offering price not to exceed \$150,000,000. The securities registered hereunder also include such indeterminate number of shares of common stock as may be issued upon conversion, exercise or exchange of warrants that provide for such conversion into, exercise for or exchange into shares of common stock. In addition, pursuant to Rule 416 under the Securities Act of 1933, as amended, or the Securities Act, the shares of common stock being registered hereunder include such indeterminate number of shares of common stock as may be issuable with respect to the shares being registered hereunder as a result of stock splits, stock dividends, or similar transactions.
- (2) Estimated solely to calculate the registration fee in accordance with Rule 457(o) under the Securities Act. The aggregate maximum offering price of all securities issued pursuant to this registration statement will not exceed \$150,000,000.
- (3) Calculated pursuant to Rule 457(o) based on an estimate of the proposed maximum aggregate offering price.
- (4) Not required to be included in accordance with General Instruction II.D. of Form S-3 and Rule 457(o).

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities, and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

PRELIMINARY PROSPECTUS (Subject to Completion)
Dated September 26, 2011



\$150,000,000

PLURISTEM THERAPEUTICS INC.

**Common Stock
Preferred Stock
Warrants
Units**

We may from time to time sell common stock, preferred stock and warrants to purchase common stock, and units of two or more of such securities, in one or more offerings for an aggregate initial offering price of \$150,000,000. We refer to the common stock, the preferred stock, the warrants to purchase common stock and the units collectively as the securities. This prospectus describes the general manner in which our securities may be offered using this prospectus. We will specify in an accompanying prospectus supplement the terms of the securities to be offered and sold. We may sell these securities to or through underwriters or dealers, directly to purchasers or through agents. We will set forth the names of any underwriters, dealers or agents in an accompanying prospectus supplement.

Our common stock is traded on the NASDAQ Capital Market under the symbol "PSTI.

Investing in our securities involves risks. See "Risk Factors" on page 4 of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

This prospectus is dated _____.

TABLE OF CONTENTS

<u>ABOUT THIS PROSPECTUS</u>	2
<u>OUR COMPANY</u>	3
<u>RISK FACTORS</u>	4
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION</u>	4
<u>USE OF PROCEEDS</u>	5
<u>THE SECURITIES WE MAY OFFER</u>	5
<u>DESCRIPTION OF CAPITAL STOCK</u>	5
<u>DESCRIPTION OF WARRANTS</u>	6
<u>DESCRIPTION OF UNITS</u>	8
<u>PLAN OF DISTRIBUTION</u>	9
<u>VALIDITY OF THE SECURITIES</u>	12
<u>EXPERTS</u>	12
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	12
<u>INCORPORATION OF DOCUMENTS BY REFERENCE</u>	12

You should rely only on the information contained in this prospectus and the documents incorporated by reference in this prospectus or to which we have referred you. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus does not constitute an offer to sell, or a solicitation of an offer to purchase, the securities offered by this prospectus in any jurisdiction to or from any person to whom or from whom it is unlawful to make such offer or solicitation of an offer in such jurisdiction. You should not assume that the information contained in this prospectus or any document incorporated by reference is accurate as of any date other than the date on the front cover of the applicable document. Neither the delivery of this prospectus nor any distribution of securities pursuant to this prospectus shall, under any circumstances, create any implication that there has been no change in the information set forth or incorporated by reference into this prospectus or in our affairs since the date of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a “shelf” registration process. Under this shelf registration process, we may, from time to time, sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of \$150,000,000. This prospectus describes the securities we may offer and the general manner in which our securities may be offered by this prospectus. Each time we sell securities, we will provide a prospectus supplement that will contain specific information about the terms of that offering. We may also add, update or change in the prospectus supplement any of the information contained in this prospectus. To the extent there is a conflict between the information contained in this prospectus and the prospectus supplement, you should rely on the information in the prospectus supplement, provided that if any statement in one of these documents is inconsistent with a statement in another document having a later date — for example, a document incorporated by reference in this prospectus or any prospectus supplement — the statement in the document having the later date modifies or supersedes the earlier statement.

OUR COMPANY

We are a leading bio-therapeutic company developing standardized cell therapy products for the treatment of life threatening diseases. We are developing a pipeline of products, stored ready-to-use, derived from human placenta, a non-controversial, non-embryonic, adult cell source. Placental-derived adherent stromal cells are grown in the Company's proprietary PluriX™ three-dimensional process that allows cells to grow in a more natural environment and enable us to produce large quantities of clinical grade cells. We refer to the cells that are grown in the PluriX™ as our PLacental eXpanded cells, or PLX cells. We are expanding our in-house manufacturing capacity so that we will be able to grow large scale quantities of our cells efficiently and without reliance on outside vendors.

Our strategy is to develop and manufacture cell therapy products for the treatment of multiple disorders via several routes of administration. We plan to execute this strategy both independently, using our own personnel and via relationships with research and clinical institutions, or in collaboration with other companies, such as United Therapeutics Corporation, or United. We plan to have in-house manufacturing capacity of clinical grade PLX cells in commercial quantities and to control all of our proprietary manufacturing processes in order to assist in executing this strategy.

We believe that intramuscular administration, or IM, which means that the cells are administrated locally to the muscle and not systemically, may be suited for a number of different clinical indications. Such indications include peripheral artery disease, or PAD, critical limb ischemia, or CLI, intermittent claudication, or IC, muscle injuries, thromboangiitis obliterans, or Buerger's disease, neuropathic pain, wound healing and orthopedic injuries. In addition, we have reported pre-clinical studies utilizing successfully our proprietary PLX cells when administered systemically via the intravenous route, or IV, in treating multiple sclerosis, ischemic stroke, inflammatory bowel disease and radiation exposure. Under our exclusive license agreement with United, we plan to participate in the development and commercialization of a PLX cell-based product for the treatment of Pulmonary Arterial Hypertension, or PAH.

Our first product in development, called PLX-PAD, is intended to improve the quality of life of millions of people suffering from PAD. On April 13, 2011, following completion of three and six month clinical follow-ups using our PLX cells in CLI, the end-stage of PAD, we announced that the data collected from our two open-label, dose-escalation, Phase I clinical trials conducted in the United States and Germany suggests that PLX-PAD is safe, improves quality of life, and is potentially effective in treating patients and reducing amputations.

In January 2011, we successfully completed a parallel scientific advisory process with the European Medicines Agencies (EMA) and the US Food and Drug Administration (FDA) that will allow us to pursue a comprehensive approach towards the treatment of two major components of PAD, IC and CLI, with our placenta-derived PLX cells. The comprehensive clinical plan includes a multinational Phase II study in IC and a multinational Phase II/III pivotal study in CLI.

On June 19, 2011, we entered into an exclusive license agreement, or the License Agreement, with United, for the use of our PLX cells to develop and commercialize a cell-based product for the treatment of PAH. The License Agreement provides that United will receive exclusive worldwide license rights for the development and commercialization of our PLX cell-based product to treat PAH. The License Agreement provides for the following consideration payable to us: (i) \$7 million paid to us in August 2011; (ii) up to \$37.5 million upon reaching certain regulatory milestones with respect to the development of a product to treat PAH; (iii) reimbursement of up to \$10 million of certain of our expenses if we establish a manufacturing facility in North America upon meeting certain milestones; (iv) reimbursement of certain costs in connection with the development of the product; and (v) following commercialization of the product, royalties and the purchase of commercial supplies of the developed product from us at a specified margin over our cost.

Our shares of common stock are traded on the NASDAQ Capital Market under the symbol "PSTI", on the Tel Aviv Stock Exchange under the symbol "PLTR" and on the Frankfurt Stock Exchange in Europe under the symbol "PJT".

Our executive offices are located at MATAM Advanced Technology Park, Building No. 20, Haifa, Israel, our telephone number is 011 972 74 710 7171 and our website address is www.pluristem.com. The information on our website is not incorporated by reference in this prospectus and should not be considered to be part of this prospectus. Our website address is included in this prospectus as an inactive technical reference only. Our name and logo and the names of our products are our trademarks or registered trademarks. Unless the context otherwise requires, references in this prospectus to "Pluristem," "we," "us," and "our" refer to Pluristem Therapeutics Inc. and its subsidiary as required by the context.

RISK FACTORS

An investment in our securities involves significant risks. You should carefully consider the risk factors contained in any prospectus supplement and in our filings with the SEC, as well as all of the information contained in this prospectus, any prospectus supplement and the documents incorporated by reference in this prospectus, before you decide to invest in our securities. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our operations.

SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus, any prospectus supplement and the documents we incorporate by reference in this prospectus contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 and other Federal securities laws. All statements, other than statements of historical fact, that we include in this prospectus, any prospectus supplement and in the documents we incorporate by reference in this prospectus, may be deemed forward-looking statements for purposes of the Securities Act of 1933, or the Securities Act, and the Securities Exchange Act of 1934, or the Exchange Act. We use the words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "project," "will," "would" and similar expressions to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We cannot guarantee that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and, accordingly, you should not place undue reliance on our forward-looking statements. There are a number of important factors that could cause actual results or events to differ materially from the forward-looking statements that we make, including the factors included in the documents we incorporate by reference in this prospectus. You should read these factors and the other cautionary statements made in the documents we incorporate by reference as being applicable to all related forward-looking statements wherever they appear in this prospectus, any prospectus supplement and any document incorporated by reference. We caution you that, except as otherwise required by law, we do not undertake any obligation to update forward-looking statements we make.

USE OF PROCEEDS

Unless we otherwise indicate in the applicable prospectus supplement, we currently intend to use the net proceeds from the sale of the securities for research and product development activities, clinical trial activities, investment in capital equipment and for working capital and other general corporate purposes.

We may set forth additional information on the use of net proceeds from the sale of securities we offer under this prospectus in a prospectus supplement relating to the specific offering. Pending the application of the net proceeds, we intend to invest the net proceeds in bank deposits or investment-grade, interest-bearing securities subject to any investment policies our investment committee may determine from time to time.

THE SECURITIES WE MAY OFFER

The descriptions of the securities contained in this prospectus, together with the applicable prospectus supplement, summarize the material terms and provisions of the various types of securities that we may offer. We will describe in the applicable prospectus supplement relating to any securities the particular terms of the securities offered by that prospectus supplement. If we so indicate in the applicable prospectus supplement, the terms of the securities may differ from the terms we have summarized below. We may also include in the prospectus supplement information, where applicable, about material United States federal income tax consequences relating to the securities, and the securities exchange or market, if any, on which the securities will be listed.

We may sell from time to time, in one or more offerings, one or more of the following securities:

- common stock;
- warrants to purchase common stock;
- preferred stock; and
- units of two or more of the securities mentioned above.

The total initial offering price of all securities that we may issue in these offerings will not exceed \$150,000,000.

DESCRIPTION OF CAPITAL STOCK

Our authorized capital stock currently consists of 100,000,000 shares of common stock, of which there were 42,936,719 shares outstanding as of September 25, 2011, and 10,000,000 shares of "blank check" preferred stock, none of which are outstanding. The following statements set forth the material terms of our capital stock; however, reference is made to the more detailed provisions of, and these statements are qualified in their entirety by reference to, our Articles of Incorporation and Bylaws, copies of which are referenced as exhibits herein, and the provisions of Nevada General Corporation Law. There are no provisions in our Articles of Incorporation or Bylaws that would delay, defer or prevent a change in our control.

Common Stock

Except as otherwise required by applicable law and subject to the preferential rights of any outstanding preferred stock, all voting rights are vested in and exercised by the holders of common stock with each share of our common stock being entitled to one vote. In the event of liquidation, holders of the common stock are entitled to share ratably in the distribution of assets remaining after payment of liabilities, if any. Holders of the common stock have no cumulative voting rights and no preemptive or other rights to subscribe for shares. Holders of Common Stock are entitled to such dividends as may be declared by the Board of Directors out of funds legally available therefor.

Blank Check Preferred Stock

Our Board of Directors is empowered, without further action by stockholders, to issue from time to time one or more series of preferred stock, with such designations, rights, preferences and limitations as the Board may determine by resolution. The rights, preferences and limitations of separate series of preferred stock may differ with respect to such matters among such series as may be determined by the Board, including, without limitation, the rate of dividends, method and nature of payment of dividends, terms of redemption, amounts payable on liquidation, sinking fund provisions (if any), conversion rights (if any) and voting rights. Certain issuances of preferred stock may have the effect of delaying or preventing a change in control of our company that some stockholders may believe is not in their interest.

Transfer Agent

American Stock Transfer and Trust Company, LLC is the registrar and transfer agent for our common shares. Their address is 6201 15th Avenue, 2nd Floor, Brooklyn, NY 11219, telephone: (718) 921-8261, (800) 937-5449.

Nevada Anti-Takeover Law and Charter and Bylaws Provisions

Nevada revised statutes sections 78.378 to 78.3793 provide state regulation over the acquisition of a controlling interest in certain Nevada corporations unless the articles of incorporation or bylaws of the corporation provide that the provisions of these sections do not apply. This statute currently does not apply to our Company because in order to be applicable we would have to have as shareholders a specified number of Nevada residents and we would have to do business in Nevada directly or through an affiliate.

DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplement, summarizes the material terms and provisions of the warrants that we may offer under this prospectus and the related warrant agreements and warrant certificates. While the terms summarized below will apply generally to any warrants that we may offer, we will describe the particular terms of any series of warrants in more detail in the applicable prospectus supplement. If we so indicate in a prospectus supplement, the terms of any warrants offered under that prospectus supplement may differ from the terms we describe below. Specific warrant agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement.

General

We may issue warrants for the purchase of common stock in one or more series. We may issue warrants independently or together with common stock, and the warrants may be attached to or separate from the common stock.

We will evidence each series of warrants by warrant certificates that we will issue under a separate agreement or by warrant agreements that we will enter into directly with the purchasers of the warrants. If we evidence warrants by warrant certificates, we will enter into a warrant agreement with a warrant agent. We will indicate the name and address of the warrant agent, if any, in the applicable prospectus supplement relating to a particular series of warrants.

We will describe in the applicable prospectus supplement the terms of the series of warrants, including:

- the offering price and aggregate number of warrants offered;
- the currency for which the warrants may be purchased or exercised;
- if applicable, the terms of the common stock with which the warrants are issued and the number of warrants issued with such common stock;
- if applicable, the date on and after which the warrants and the related common stock will be separately transferable;
- the number of shares of common stock purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;
- the manner in which the warrants may be exercised, which may include by cashless exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;
- the terms of any rights to redeem or call the warrants;
- any provisions for changes to or adjustments in the exercise price or number of shares of common stock issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreement and warrants may be modified;
- the material United States federal income tax consequences of holding or exercising the warrants;
- the terms of the common stock issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Before exercising their warrants, holders of warrants will not have any of the rights of holders of the common stock purchasable upon such exercise, including the right to receive dividends, if any, or payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any.

Exercise of Warrants

Each warrant will entitle the holder to purchase the number of shares of common stock that we specify in the applicable prospectus supplement at the exercise price that we describe in the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to 5:00 P.M., Eastern U.S. time, on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Holders of the warrants may exercise the warrants by delivering to the warrant agent or us the warrant certificate or warrant agreement representing the warrants to be exercised together with specified information, and by paying the required amount to the warrant agent or us in immediately available funds, as provided in the applicable prospectus supplement. We will set forth on the reverse side of the warrant certificate or in the warrant agreement and in the applicable prospectus supplement the information that the holder of the warrant will be required to deliver to the warrant agent or us in connection with such exercise.

Upon receipt of the required payment and the warrant certificate or the warrant agreement, as applicable, properly completed and duly executed at the corporate trust office of the warrant agent, if any, at our offices or at any other office indicated in the applicable prospectus supplement, we will issue and deliver the common stock purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate or warrant agreement are exercised, then we will issue a new warrant certificate or warrant agreement for the remaining amount of warrants.

Enforceability of Rights by Holders of Warrants

If we appoint a warrant agent, any warrant agent will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the securities purchasable upon exercise of, its warrants.

DESCRIPTION OF UNITS

We may issue, in one or more series, units consisting of common stock, preferred stock and/or warrants for the purchase of common stock and/or preferred stock, in any combination. While the terms we have summarized below will apply generally to any units that we may offer under this prospectus, we will describe the particular terms of any series of units in more detail in the applicable prospectus supplement. The terms of any units offered under a prospectus supplement may differ from the terms described below.

We will file as exhibits to a prospectus supplement, or will incorporate by reference from reports that we file with the SEC, the form of unit agreement that describes the terms of the series of units we are offering, and any supplemental agreements, before the issuance of the related series of units. The following summaries of material terms and provisions of the units are subject to, and qualified in their entirety by reference to, all the provisions of the unit agreement and any supplemental agreements applicable to a particular series of units. We urge you to read the applicable prospectus supplement related to the particular series of units that we may offer under this prospectus and the complete unit agreement and any supplemental agreements that contain the terms of the units.

Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

We will describe in the applicable prospectus supplement the terms of the series of units, including:

- the designation and terms of the units, including whether and under what circumstances the securities comprising the units may be held or transferred separately;
- any provisions of the governing unit agreement that differ from those described below; and
- any provisions for the issuance, payment, settlement, transfer or exchange of the units or the securities comprising the units.

The provisions described in this section, as well as those described under “Description of Capital Stock” and “Description of Warrants” will apply to each unit and to any common stock, preferred stock or warrant included in each unit, respectively.

We may issue units in such amounts and in such distinct series as we determine.

PLAN OF DISTRIBUTION

We may sell the securities being offered hereby in one or more of the following ways from time to time:

- through agents to the public or to investors;
- to one or more underwriters for resale to the public or to investors;
- in “at the market offerings,” within the meaning of Rule 415(a)(4) of the Securities Act, to or through a market maker or into an existing trading market, on an exchange or otherwise;
- directly to investors in privately negotiated transactions;
- directly to a purchaser pursuant to what is known as an “equity line of credit” as described below; or
- through a combination of these methods of sale.

The securities that we distribute by any of these methods may be sold, in one or more transactions, at:

- a fixed price or prices, which may be changed;
- market prices prevailing at the time of sale;
- prices related to prevailing market prices; or
- negotiated prices.

The accompanying prospectus supplement will describe the terms of the offering of our securities, including:

- the name or names of any agents or underwriters;
- any securities exchange or market on which the common stock may be listed;
- the purchase price and commission, if any, to be paid in connection with the sale of the securities being offered and the proceeds we will receive from the sale;
- any over-allotment options pursuant to which underwriters may purchase additional securities from us;

- any underwriting discounts or agency fees and other items constituting underwriters' or agents' compensation;
- any public offering price; and
- any discounts or concessions allowed or reallocated or paid to dealers.

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of the sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all the securities offered by the prospectus supplement. We may change from time to time the public offering price and any discounts or concessions allowed or reallocated or paid to dealers.

We may also sell securities pursuant to an "equity line of credit". In such event, we will enter into a common stock purchase agreement with the purchaser to be named therein, which will be described in a Current Report on Form 8-K that we will file with the SEC. In that Form 8-K, we will describe the total amount of securities that we may require the purchaser to purchase under the purchase agreement and the other terms of purchase, and any rights that the purchaser is granted to purchase securities from us. In addition to our issuance of shares of common stock to the equity line purchaser pursuant to the purchase agreement, this prospectus (and the applicable prospectus supplement or post-effective amendment) also covers the resale of those shares from time to time by the equity line purchaser to the public. The equity line purchaser will be considered an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act. Its resales may be effected through a number of methods, including without limitation, ordinary brokerage transactions and transactions in which the broker solicits purchasers and block trades in which the broker or dealer so engaged will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction. The equity line purchaser will be bound by various anti-manipulation rules of the SEC and may not, for example, engage in any stabilization activity in connection with its resales of our securities and may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities other than as permitted under the Exchange Act.

We may sell our securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of our common stock, and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

We may provide underwriters and agents with indemnification against civil liabilities related to this offering, including liabilities under the Securities Act, or contribution with respect to payments that the underwriters or agents may make with respect to these liabilities. Underwriters and agents may engage in transactions with, or perform services for, us in the ordinary course of business. We will describe such relationships in the prospectus supplement naming the underwriter or agent and the nature of any such relationship.

Rules of the SEC may limit the ability of any underwriters to bid for or purchase securities before the distribution of the shares of common stock is completed. However, underwriters may engage in the following activities in accordance with the rules:

- *Stabilizing transactions* — Underwriters may make bids or purchases for the purpose of pegging, fixing or maintaining the price of the shares, so long as stabilizing bids do not exceed a specified maximum.
- *Over-allotments and syndicate covering transactions* — Underwriters may sell more shares of our common stock than the number of shares that they have committed to purchase in any underwritten offering. This over-allotment creates a short position for the underwriters. This short position may involve either “covered” short sales or “naked” short sales. Covered short sales are short sales made in an amount not greater than the underwriters’ over-allotment option to purchase additional shares in any underwritten offering. The underwriters may close out any covered short position either by exercising their over-allotment option or by purchasing shares in the open market. To determine how they will close the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market, as compared to the price at which they may purchase shares through the over-allotment option. Naked short sales are short sales in excess of the over-allotment option. The underwriters must close out any naked position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that, in the open market after pricing, there may be downward pressure on the price of the shares that could adversely affect investors who purchase shares in the offering.
- *Penalty bids* — If underwriters purchase shares in the open market in a stabilizing transaction or syndicate covering transaction, they may reclaim a selling concession from other underwriters and selling group members who sold those shares as part of the offering.

Similar to other purchase transactions, an underwriter’s purchases to cover the syndicate short sales or to stabilize the market price of our common stock may have the effect of raising or maintaining the market price of our common stock or preventing or mitigating a decline in the market price of our common stock. As a result, the price of the shares of our common stock may be higher than the price that might otherwise exist in the open market. The imposition of a penalty bid might also have an effect on the price of shares if it discourages resales of the shares.

If commenced, the underwriters may discontinue any of these activities at any time.

Our common stock is traded on the NASDAQ Capital Market, on the Tel Aviv Stock Exchange and on the Frankfurt Stock Exchange. One or more underwriters may make a market in our common stock, but the underwriters will not be obligated to do so and may discontinue market making at any time without notice. We cannot give any assurance as to liquidity of the trading market for our common stock.

Any underwriters who are qualified market makers on the NASDAQ Capital Market may engage in passive market making transactions in that market in the common stock in accordance with Rule 103 of Regulation M, during the business day prior to the pricing of the offering, before the commencement of offers or sales of the common stock. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security; if all independent bids are lowered below the passive market maker’s bid, however, the passive market maker’s bid must then be lowered when certain purchase limits are exceeded.

In compliance with guidelines of the Financial Industry Regulatory Authority, or FINRA, the maximum commission or discount to be received by any FINRA member or independent broker dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

VALIDITY OF THE SECURITIES

The validity of the securities offered hereby will be passed upon for us by Zysman, Aharoni, Gayer and Sullivan & Worcester, LLP, Boston, Massachusetts.

EXPERTS

The financial statements of Pluristem Therapeutics Inc. appearing in Pluristem Therapeutics Inc.'s Annual Report (Form 10-K) for the fiscal year ended June 30, 2011, have been audited by Kost Forer Gabbay & Kasierer, a member of Ernst & Young Global, independent registered public accounting firm, as set forth in their report thereon, included therein, and incorporated herein by reference. Such financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the SEC. You may read and copy any document we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room.

The SEC also maintains a website, the address of which is www.sec.gov. That site also contains our annual, quarterly and current reports, proxy statements, information statements and other information.

We have filed this prospectus with the SEC as part of a registration statement on Form S-3 under the Securities Act. This prospectus does not contain all of the information set forth in the registration statement because some parts of the registration statement are omitted in accordance with the rules and regulations of the SEC. You can obtain a copy of the registration statement from the SEC at the address listed above or from the SEC's website.

We also maintain a website at www.pluristem.com, through which you can access our SEC filings. The information set forth on our website and on the SEC's website is not part of this prospectus.

INCORPORATION OF DOCUMENTS BY REFERENCE

We are "incorporating by reference" certain documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents. The information in the documents incorporated by reference is considered to be part of this prospectus. Statements contained in documents that we file with the SEC and that are incorporated by reference in this prospectus will automatically update and supersede information contained in this prospectus, including information in previously filed documents or reports that have been incorporated by reference in this prospectus, to the extent the new information differs from or is inconsistent with the old information.

We have filed or may file the following documents with the SEC. These documents are incorporated herein by reference as of their respective dates of filing:

- (1) Our Annual Report on Form 10-K for the fiscal year ended June 30, 2011;
- (2) Our Current Report on Form 8-K, as filed with the SEC on July 28, 2011;
- (3) Our Current Report on Form 8-K, as filed with the SEC on August 3, 2011;
- (4) Our Current Report on Form 8-K, as filed with the SEC on August 25, 2011;
- (5) Our Current Report on Form 8-K, as filed with the SEC on September 15, 2011; and
- (6) The description of our common stock contained in our Registration Statement on Form 8-A filed with the SEC on December 10, 2007, as amended.

All documents filed by us pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act (1) after the date of the filing of this registration statement and prior to its effectiveness and (2) until all of the common stock to which this prospectus relates has been sold or the offering is otherwise terminated, except in each case for information contained in any such filing where we indicate that such information is being furnished and is not to be considered "filed" under the Exchange Act, will be deemed to be incorporated by reference in this prospectus and the accompanying prospectus supplement and to be a part hereof from the date of filing of such documents.

We will provide a copy of the documents we incorporate by reference, at no cost, to any person who receives this prospectus. To request a copy of any or all of these documents, you should write or telephone us at MATAM Advanced Technology Park, Building No. 20, Haifa, 31905, Israel, Attention: Yaky Yanay, (+972) 74 710 7171.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

The following table sets forth the various expenses to be incurred in connection with the registration of the securities being registered hereby, all of which will be borne by the registrant. All amounts shown are estimates except the SEC registration fee.

SEC registration fee	\$ 17,415
Legal fees and expenses	10,000
Accounting fees and expenses	5,000
Miscellaneous	2,585
Total expenses	<u>\$ 35,000</u>

Item 15. Indemnification of Directors and Officers.

Under the Nevada Revised Statutes, director immunity from liability to a company or its shareholders for monetary liabilities applies automatically unless it is specifically limited by a company's Articles of Incorporation. Our Articles of Incorporation provide that we shall indemnify our officers, directors, employees and agents to the fullest extent permitted by the laws of the State of Nevada. In addition, our Articles of Incorporation provide that a director or officer of the company shall not be personally liable to the company or our stockholders for damages for breach of fiduciary duty as a director or officer, but such statement shall not eliminate or limit the liability of a director or officer for (i) acts or omissions which involve intentional misconduct, fraud or a knowing violation of the law or (ii) the unlawful payment of dividends. Any repeal or modification of the provisions described in this paragraph by stockholders of the company will be prospective only, and will not adversely affect any limitation on the personal liability of a director or officer of the company for acts or omissions prior to such repeal or modification.

Further, our Articles of Incorporation provide that every person who was or is a party to, or is threatened to be made a party to, or is involved in any such action, suit or proceeding, whether civil, criminal, administrative or investigative, by the reason of the fact that he or she, or a person with whom he or she is a legal representative, is or was a director of the company, or who is serving at the request of the company as a director or officer of another company, or is a representative in a partnership, joint venture, trust or other enterprise, shall be indemnified and held harmless to the fullest extent legally permissible under the laws of the State of Nevada from time to time against all expenses, liability and loss (including attorneys' fees, judgments, fines, and amounts paid or to be paid in a settlement) reasonably incurred or suffered by him or her in connection therewith. Such right of indemnification will be a contract right which may be enforced in any manner desired by such person. The expenses of officers and directors incurred in defending a civil suit or proceeding must be paid by the company as incurred and in advance of the final disposition of the action, suit, or proceeding, under receipt of an undertaking by or on behalf of the director or officer to repay the amount if it is ultimately determined by a court of competent jurisdiction that he or she is not entitled to be indemnified by the company. Such right of indemnification will not be exclusive of any other right of such directors, officers or representatives may have or hereafter acquire, and, without limiting the generality of such statement, they shall be entitled to their respective rights of indemnification under any bylaw, agreement, vote of stockholders, provision of law, or otherwise, as well as their rights under this paragraph above.

We have obtained directors and officers insurance for the benefit of its directors and its officers.

Item 16. Exhibits and Financial Statement Schedules.

The exhibits to this Registration Statement are listed in the Exhibit Index following the signature page of this Registration Statement.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this registration statement. Notwithstanding the foregoing, any increase or decrease in the volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in this registration statement or any material change to such information in this registration statement;

provided, however, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the SEC by the registrant pursuant to Section 13 or 15(d) of the Exchange Act that are incorporated by reference in the registration statement or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser:

(i) If the registrant is relying on Rule 430B:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5) or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date; or

(ii) If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13 (a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Haifa, State of Israel, on September 26, 2011.

PLURISTEM THERAPEUTICS INC.

By: /s/ Zami Aberman
Zami Aberman
Chief Executive Officer

SIGNATURES AND POWER OF ATTORNEY

The undersigned officers and directors of Pluristem Therapeutics Inc. hereby constitute and appoint Zami Aberman and Yaky Yanay, and each of them singly, with full power of substitution, our true and lawful attorneys-in-fact and agents to take any actions to enable Pluristem Therapeutics Inc. to comply with the Securities Act, and any rules, regulations and requirements of the SEC, in connection with this registration statement, including the power and authority to sign for us in our names in the capacities indicated below any and all amendments to this registration statement and any other registration statement filed pursuant to the provisions of Rule 462 under the Securities Act.

Pursuant to the requirements of the Securities Act, this Registration Statement has been signed by the following persons in the capacities indicated as of the date indicated below.

Signature	Title	Date
<u>/s/ Zami Aberman</u> Zami Aberman	Chief Executive Officer, Director and Chairman of the Board (Principal Executive Officer)	September 26, 2011
<u>/s/ Yaky Yanay</u> Yaky Yanay	Chief Financial Officer (Principal Financial and Accounting Officer)	September 26, 2011
<u>/s/ Israel Ben-Yoram</u> Israel Ben-Yoram	Director	September 26, 2011
<u>/s/ Isaac Braun</u> Isaac Braun	Director	September 26, 2011
<u>/s/ Mark Germain</u> Mark Germain	Director	September 26, 2011
<u>/s/ Hava Meretzki</u> Hava Meretzki	Director	September 26, 2011
<u>/s/ Shai Pines</u> Shai Pines	Director	September 26, 2011
<u>/s/ Nahum Rosman</u> Nahum Rosman	Director	September 26, 2011
<u>/s/ Doron Shorrer</u> Doron Shorrer	Director	September 26, 2011

EXHIBIT INDEX

Exhibit No.	Description
1.1	Any form of equity underwriting agreement will be filed as an exhibit to a Current Report of the registrant on Form 8-K and incorporated herein by reference.
4.1	Composite Copy of the Company's Articles of Incorporation as amended on December 22, 2009 (incorporated by reference to Exhibit 3.1 of our quarterly report on Form 10-Q filed February 11, 2010).
4.2	Amended By-laws (incorporated by reference to exhibit 3.1 of our Current Report on Form 8-K filed on January 22, 2007).
4.3	The form of warrant agreement, if any, will be filed as an exhibit to a Current Report of the registrant on Form 8-K and incorporated herein by reference.
5.1*	Opinion of Zysman Aharoni, Gayer and Sullivan & Worcester LLP.
23.1	Consent of Zysman Aharoni, Gayer and Sullivan & Worcester LLP, included in Exhibit 5.1.
23.2*	Consent of Kost Forer Gabbay & Kasierer, A member of Ernst & Young Global.
24.1*	Power of Attorney (See page II-5 of this Registration Statement).
*	Filed herewith.

Zysman, Aharoni, Gayer and Sullivan & Worcester LLP
One Post Office Square
Boston, MA 02109

September 26, 2011

Pluristem Therapeutics Inc.
Matam Advanced Technology Park
Building No. 20
Haifa 31905, Israel

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

This opinion is furnished to you in connection with a Registration Statement on Form S-3 (the "Registration Statement") being filed by Pluristem Therapeutics Inc., a Nevada corporation (the "Company"), with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), for the registration of shares of Common Stock, \$0.00001 par value per share of the Company (the "Shares"), warrants to purchase Shares (the "Warrants"), shares of preferred stock (the "Preferred Shares"), and, with the Shares and the Warrants, the "Securities") and units of two or more of the Securities (the "Units"), all of which may be issued from time to time on a delayed or continuous basis pursuant to Rule 415 under the Securities Act.

We are acting as counsel for the Company in connection with the Registration Statement. We have examined signed copies of the Registration Statement and have also examined and relied upon minutes of meetings of the Board of Directors of the Company as provided to us by the Company, the Articles of Incorporation and By-Laws of the Company, each as restated and/or amended to date (collectively the "Charter Documents"), and such other documents as we have deemed necessary for purposes of rendering the opinions hereinafter set forth.

In our examination of the foregoing documents, we have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as copies, the authenticity of the originals of such latter documents and the legal competence of all signatories to such documents. For purposes of our opinion, we have examined an official compilation of "Title 7 - Business Associations; Securities; Commodities, Chapter - 78 - Private Corporations" of the Nevada Revised Statutes. Such examination was limited to the provisions of such statute only, and did not include any annotations or commentary related thereto. Other than such examination and our examination of the documents indicated above, we have made no other examination in connection with this opinion.

Based upon and subject to the foregoing, we are of the opinion that:

(1) With respect to the Shares, when (i) specifically authorized for issuance by the Company's Board of Directors or an authorized committee thereof (the "Authorizing Resolutions"); (ii) the Registration Statement has become effective under the Securities Act; (iii) if necessary, an appropriate prospectus supplement with respect to the Shares has been prepared, filed and delivered in compliance with the Securities Act and the applicable rules promulgated thereunder; (iv) the terms of the sale of the Shares have been duly established in conformity with the Charter Documents and do not violate any applicable law or result in a default under or breach of any agreement or instrument binding on the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company; (v) the Shares have been issued and sold as contemplated by the Registration Statement and any prospectus supplement, if applicable; and (vi) the Company has received the consideration provided for in the Authorizing Resolutions and such consideration is not less than the par value of the Shares, the Shares will be validly issued, fully paid and nonassessable.

(2) With respect to the Warrants, when (i) specifically authorized for issuance by the Authorizing Resolutions; (ii) the Registration Statement has become effective under the Securities Act; (iii) the warrant agreement or agreements relating to the Warrants have been duly authorized, executed and delivered; (iv) the terms of the Warrants and of their issuance and sale have been duly established in conformity with the warrant agreement or agreements and do not violate any applicable law or result in a default under or breach of any agreement or instrument binding upon the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company; (v) the Warrants have been duly executed and countersigned in accordance with the warrant agreement or agreements and issued and sold as contemplated by the Registration Statement; and (vi) the Company has received the consideration (if any separate consideration is given for the Warrants) provided for in the Authorizing Resolutions, the Warrants will constitute valid and legally binding obligations of the Company, subject to bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium and similar laws of general applicability relating to or affecting creditors' rights and to general equity principles.

(3) With respect to the Preferred Shares, when (i) the Board shall have duly adopted resolutions approving a certificate of designation (the "Certificate of Designation") setting forth the terms of a series of Preferred Shares, including, as applicable, designations and powers, preferences and relative, participating, optional or other special rights, and qualifications, limitations or restrictions thereof, including without limitation the dividend rate, conversion or exchange rights, redemption price and liquidation preference; (ii) the Certificate of Designation shall have been duly executed and filed with the Secretary of State of Nevada; (iii) specifically authorized for issuance by the Authorizing Resolutions; (iv) the Registration Statement has become effective under the Securities Act; (v) if necessary, an appropriate prospectus supplement with respect to the Preferred Shares has been prepared, filed and delivered in compliance with the Securities Act and the applicable rules promulgated thereunder; (vi) the terms of the sale of the Preferred Shares have been duly established in conformity with the Charter Documents and do not violate any applicable law or result in a default under or breach of any agreement or instrument binding on the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company; (vii) the Preferred Shares have been issued and sold as contemplated by the Registration Statement and any prospectus supplement, if applicable, and (viii) the Company has received the consideration provided for in the Authorizing Resolutions and such consideration is not less than the par value of the Preferred Shares, the Preferred Shares will be validly issued, fully paid and nonassessable.

(4) With respect to the Units, when (i) at the time of execution, issuance and delivery of the Units and any agreement related thereto will have been duly authorized, executed and delivered by the Company and the other parties to such agreement and will be the valid and legally binding obligation of the parties thereto, enforceable against such parties in accordance with its terms; and (ii) all necessary conditions and actions with respect to the Securities of which the Units are comprised shall have been duly met or taken, as provided for in (1) – (3) above, as applicable, the Units will be validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion as Exhibit 5.1 to the Registration Statement and to the reference to this firm under the caption “Validity of the Securities” in the Prospectus. In giving such consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission.

Very truly yours,

/s/ Zysman, Aharoni, Gayer and Sullivan & Worcester LLP

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM'S CONSENT

We consent to the reference to our firm under the caption "Experts" in the Registration Statement (Form S-3) and to the incorporation by reference therein of our report dated September 07, 2011, with respect to the consolidated financial statements of Pluristem Therapeutics Inc., included in the Annual Report (Form 10-K) of Pluristem Therapeutics Inc. for the year ended June 30, 2011, filed with the Securities and Exchange Commission.

/s/ Kost Forer Gabbay & Kasierer
Kost Forer Gabbay & Kasierer
A Member of Ernst & Young Global

Haifa, Israel

September 26, 2011
